SEQUENCE LISTING
<110> RIKEN
<120> Fluorescent protein
<130> A41348A
<160> 21
<210> 1
<211> 227
<212> PRT
<213> favia favus
<400> 1
Met Ser Val Ile Thr Ser Glu Met Lys Met Glu Leu Leu Met Glu Gly
1 5 10 15
Ala Val Asn Gly His Lys Phe Val Ile Thr Gly Lys Gly Ser Gly Gln
20 25 30
Pro Phe Glu Gly Ile Gln Asn Met Asp Leu Thr Val Ile Glu Gly Gly
35 40 45
Pro Leu Pro Phe Ala Phe Asp Ile Leu Thr Thr Val Phe Asp Tyr Gly
50 55 60
Asn Arg Val Phe Val Lys Tyr Pro Glu Glu Ile Val Asp Tyr Phe Lys
65 70 75 80
Gln Ser Phe Pro Glu Gly Tyr Ser Trp Glu Arg Ser Met Ser Tyr Glu
85 90 96
Asp Gly Gly Ile Cys Leu Ala Thr Asn Asn Ile Thr Met Lys Lys Asp
100 105 110
Gly Ser Asn Cys Phe Val Tyr Glu Ile Arg Phe Asp Gly Val Asn Phe
115 120 125
Pro Ala Asn Gly Pro Val Met Gln Arg Lys Thr Val Lys Trp Glu Pro

130 135 140
Thr Glu Lys Met Tyr Val Arg Asp Gly Val Lou

Ser Thr Glu Lys Met Tyr Val Arg Asp Gly Val Leu Lys Gly Asp Val 145 150 155 160

Asn Met Ala Leu Leu Gln Gly Gly Gly His Tyr Arg Cys Asp Phe 165 170 175

Arg Thr Thr Tyr Lys Ala Lys Lys Val Val Gln Leu Pro Asp Tyr His

180 185 190

Phe Val Asp His Arg Ile Glu Ile Thr Ser His Asp Lys Asp Tyr Asn 195-- 200 205

Lys Val Lys Leu Tyr Glu His Ala Lys Ala His Ser Gly Leu Pro Arg 210 215 220

Leu Ala Lys

225

⟨210⟩ 2

<211> 684

<212> DNA

<213> favia favus

;

<400> 2

atg agt gtg att aca tca gaa atg aag atg gag ctg ctt atg gaa ggc 48

Met Ser Val Ile Thr Ser Glu Met Lys Met Glu Leu Leu Met Glu Gly

1 5 10 15

gct gta aac ggg cac aag ttc gtg att aca ggg aaa gga agt ggc cag 96 Ala Val Asn Gly His Lys Phe Val Ile Thr Gly Lys Gly Ser Gly Gln

20 25 30

cct ttc gag gga ata cag aat atg gac ctg aca gtc ata gag ggc gga 144 Pro Phe Glu Gly Ile Gln Asn Met Asp Leu Thr Val Ile Glu Gly Gly

35 40 45

CCL	CLL	CCL	ιιι	gcı	ııc	gat	atc	ctg	aca	aca	gta	ttc	gat	tac	ggc	192
Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile	Leu	Thr	Thr	Val	Phe	Asp	Tyr	Gly	
	50					55					60					
aac	cgg	gta	ttt	gtc	aaa	tac	cca	gaa	gaa	ata	gta	gac	tac	ttc	aag	240
Asn	Arg	Val	Phe	Val	Lys	Tyr	Pro	Glu	Glu	Ile	Val	Asp	Tyr	Phe	Lys	
65					70					75					80	
cag	tcg	ttt	cct	gag	ggt	tat	tct	tgg	gaa	cga	agc	atg	agt	tac	gaa	288
Gln	Ser	Phe	Pro	Glu	Gly	Tyr	Ser	Trp	G1u	Arg	Ser	Met	Ser	Tyr	Glu	
				85					90					96		
gac	ggg	gga	att	tgc	ctc	gcc	aca	aac	aat	ata	acg	atg	aag	aaa	gac	336
Asp	Gly	Gly	Ile	Cys	Leu	Ala	Thr	Asn	Asn	Ile	Thr	Met	Lys	Lys	Asp	
			100					105					110			
ggc	agc	aac	tgt	ttt	gtc	tat	gaa	att	cga	ttt	gat	ggt	gtg	aac	ttt	384
Gly	Ser	Asn	Cys	Phe	Val	Tyr	Glu	Ile	Arg	Phe	Asp	Gly	Val	Asn	Phe	
		115					120					125				
cct	gcc	aat	ggt	cca	gtt	atg	cag	agg	aag	acc	gtc	aaa	tgg	gag	cca	432
Pro	Ala	Asn	Gly	Pro	Val	Met	G1n	Arg	Lys	Thr	Val	Lys	Trp	G1u	Pro	
	130					135					140					
tcc	act	gag	aaa	atg	tat	gtg	cgt	gat	gga	gtg	ctg	aag	ggt	gat	gtt	480
Ser	Thr	Glu	Lys	Met	Tyr	Val	Arg	Asp	G1y	Val	Leu	Lys	Gly	Asp	Val	
145					150					155					160	
aac	atg	gct	ctg	ttg	ctt	caa	gga	ggt	ggc	cat	tac	cga	tgt	gac	ttc	528
Asn	Met	Ala	Leu	Leu	Leu	Gln	Gly	Gly	Gly	His	Tyr	Arg	Cys	Asp	Phe	
				165					170					175		
aga	act	act	tac	aaa	gca	aag	aag	gtt	gtc	cag	ttg	cca	gac	tat	cac	576
Arg	Thr	Thr	Tyr	Lys	Ala	Lys	Lys	Val	Val	Gln	Leu	Pro	Asp	Tyr	His	
			180					185					190			

ttc gtg gat cat cga att gag ata aca agc cat gac aag gat tac aac 624 Phe Val Asp His Arg Ile Glu Ile Thr Ser His Asp Lys Asp Tyr Asn 195 200 205 aag gtt aag ctg tat gag cat gct aaa gct cat tcc ggg ctg cca agg 672 Lys Val Lys Leu Tyr Glu His Ala Lys Ala His Ser Gly Leu Pro Arg 210 215 220 ctg gcc aag taa 684 Leu Ala Lys 225 <210> 3 ⟨211⟩ 23 <212> DNA <213> Artificial Sequence <220> <223> Description of Artificial Sequence: Synthetic DNA <400> 3 ggiwsbgtia ayggvcayda ntt 23 <210> 4 ⟨211⟩ 27 <212> DNA <213> Artificial Sequence <220> (223) Description of Artificial Sequence: Synthetic DNA <400> 4

⟨210⟩ 5

aactggaaga attcgcggcc gcaggaa

;

<211> 23

27

```
<212> DNA
```

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 5

tgccwtttgc ittigayati ttg

23

<210> 6

<211> 35

<212> DNA --

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 6

gtcitcttyt gcaciacigg iccatydgva ggaaa

35

<210> 7

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic DNA

<400> 7

ggccacgcgt cgactagtac gggiigggii gggiig 36

<210> 8

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

```
<223> Description of Artificial Sequence: Synthetic DNA
<400> 8
ttgtcaagat atcgaaagcg aacggcagag
                                                  30
<210> 9
<211> 20
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence: Synthetic DNA
<400> 9
ggccacgcgt cgactagtac
                                                 20
<210> 10
<211> 30
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence: Synthetic DNA
<400> 10
gtccaccctc tacgactttg agttccatat
                                                 30
<210> 11
<211> 44
<212> DNA
<213> Artificial Sequence
⟨220⟩
<223> Description of Artificial Sequence: Synthetic DNA
<400> 11
cccggatccg atgagtgtga ttacawcaga aatgaagatg gagc
                                                      44
```

1

121	0/ 1	4													
<21	1> 2	27													
<21	2> P	RT													
<21	3> f	avia	fav	us											
<40	0> 1	2													
Met	Ser	Val	Ile	Thr	Ser	Glu	Met	Lys	Met	Glu	Leu	Arg	Met	Glu	Gly
1				5					10					15	
Ala	Val	Asn	Gly	His	Lys	Phe	Val	Ile	Thr	Gly	Lys	G1y	Ser	Gly	G1n
			20					. 25					30		
Pro	Phe	Glu	Gly	Ile	Gln	Asn	Met	Asp	Leu	Thr	Val	Ile	Glu	Gly	Gly
		35					40					45			
Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile	Leu	Thr	Thr	Val	Phe	His	Tyr	Gly
	50					55					60				
Asn	Arg	Val	Phe	Val	Lys	Tyr	Pro	Glu	Glu	Ile	Val	Asp	Tyr	Phe	Lys
65					70					75					80
Gln	Ser	Phe	Pro	Glu	Gly	Tyr	Ser	Trp	Glu	Arg	Ser	Met	Ser	Tyr	Glu
				85					90					95	
Asp	Gly	Gly	Ile	Cys	Leu	Ala	Thr	Asn	Asn	Ile	Thr	Met	Lys	Lys	Asp
			100					105					110		
G1y	Ser	Asn	Cys	Phe	Val	Tyr	Glu	Ile	Arg	Phe	Asp	Gly	Val	Asn	Phe
		115					120					125			
Pro	Ala	Asn	Gly	Pro	Val	Met	Gln	Arg	Lys	Thr	Val	Lys	Trp	Glu	Pro
	130					135					140				
Ser	Thr	Glu	Lys	Met	Tyr	Val	Arg	Asp	Gly	Val	Leu	Lys	Gly	Asp	Val
145					150					155					160
Asn	Met	Ala	Leu	Leu	Leu	Gln	Gly	Gly	Gly	His	Tyr	Arg	Cys	Asp	Phe
				165					170					175	

Arg Thr Thr Tyr Lys Ala Lys Lys Val Val Gln Leu Pro Asp Tyr His 180 185 190 Phe Val Asp His Arg Ile Glu Ile Thr Ser His Asp Lys Asp Tyr Asn 195 200 205 Lys Val Lys Leu Tyr Glu His Ala Lys Ala His Ser Gly Leu Pro Arg 210 215 220 Leu Ala Lys 225 <210> 13 <211> 684 <212> DNA <213> favia favus <400> 13 atg agt gtg att aca tca gaa atg aag atg gag ctg cgt atg gaa ggc 48 Met Ser Val Ile Thr Ser Glu Met Lys Met Glu Leu Arg Met Glu Gly 1 5 10 15 gct gta aac ggg cac aag ttc gtg att aca ggg aaa gga agt ggc cag 96 Ala Val Asn Gly His Lys Phe Val Ile Thr Gly Lys Gly Ser Gly Gln 20 25 30 cct ttc gag gga ata cag aat atg gac ctg aca gtc ata gag ggc gga 144 Pro Phe Glu Gly Ile Gln Asn Met Asp Leu Thr Val Ile Glu Gly Gly 35 40 45 cct ctt cct ttt gct ttc gat atc ctg aca aca gta ttc cat tac ggc 192 Pro Leu Pro Phe Ala Phe Asp Ile Leu Thr Thr Val Phe His Tyr Gly 50 55 60 aac cgg gta ttt gtc aaa tac cca gaa gaa ata gta gac tac ttc aag 240 Asn Arg Val Phe Val Lys Tyr Pro Glu Glu Ile Val Asp Tyr Phe Lys

;′

65					70					75					80	
cag	tcg	ttt	cct	gag	ggt	tat	tct	tgg	gaa	cga	agc	atg	agt	tac	gaa	288
Gln	Ser	Phe	Pro	Glu	Gly	Tyr	Ser	Trp	Glu	Arg	Ser	Met	Ser	Tyr	Glu	
				85					90					95		
gac	ggg	gga	att	tgc	ctc	gcc	aca	aac	aat	ata	acg	atg	aag	aaa	gac	336
Asp	Gly	Gly	Ile	Cys	Leu	Ala	Thr	Asn	Asn	Ile	Thr	Met	Lys	Lys	Asp	
			100					105					110			
ggc	agc	aac	tgt	ttt	gtc	tat	gaa	att	cga	ttt	gat	ggt	gtg	aac	ttt	384
Gly	Ser	Asn-	Cys	Phe	Val	Tyr	Glu	Ile	Arg	Phe	Asp	G1y	Val	Asn	Phe	
		115					120					125				
cct	gcc	aat	ggt	cca	gtt	atg	cag	agg	aag	acc	gtc	aaa	tgg	gag	cca	432
Pro	Ala	Asn	Gly	Pro	Val	Met	G1n	Arg	Lys	Thr	Val	Lys	Trp	Glu	Pro	
	130					135					140					
tcc	act	gag	aaa	atg	tat	gtg	cgt	gat	gga	gtg	ctg	aag	ggt	gat	gtt	480
Ser	Thr	Glu	Lys	Met	Tyr	Val	Arg	Asp	Gly	Val	Leu	Lys	Gly	Asp	Val	
145					150					155					160	
aac	atg	gct	ctg	ttg	ctt	caa	gga	ggt	ggc	cat	tac	cga	tgt	gac	ttc	528
Asn	Met	Ala	Leu	Leu	Leu	Gln	Gly	Gly	Gly	His	Tyr	Arg	Cys	Asp	Phe	
				165					170					175		
aga	act	act	tac	aaa	gca	aag	aag	gtt	gtc	cag	ttg	cca	gac	tat	cac	576
Arg	Thr	Thr	Tyr	Lys	Ala	Lys	Lys	Val	Val	Gln	Leu	Pro	Asp	Tyr	His	
			180					185					190			
ttc	gtg	gat	cat	cga	att	gag	ata	aca	agc	cat	gac	aag	gat	tac	aac	624
Phe	Val	Asp	His	Arg	Ile	Glu	Ile	Thr	Ser	His	Asp	Lys	Asp	Tyr	Asn	
		195					200					205				
aag	gtt	aag	ctg	tat	gag	cat	gct	aaa	gct	cat	tcc	ggg	ctg	cca	agg	672
Lys	Val	Lys	Leu	Tyr	Glu	His	Ala	Lys	Ala	His	Ser	Gly	Leu	Pro	Arg	

210 215 220

ctg gcc aag taa 684

Leu Ala Lys

225

<210> 14

<211> 227

<212> PRT

<213> favia favus

;′

<400> 14

Met Ser Val Ile Thr Ser Glu Met Lys Met Glu Leu Arg Met Glu Gly

1 5 10 15

Ala Val Asn Gly His Lys Phe Val Ile Thr Gly Lys Gly Ser Gly Gln

20 25 30

Pro Phe Glu Gly Ile Gln Asn Val Asp Leu Thr Val Ile Glu Gly Gly

35 40 45

Pro Leu Pro Phe Ala Phe Asp Ile Leu Thr Thr Val Phe His Tyr Gly

50 55 60

Asn Arg Val Phe Val Lys Tyr Pro Glu Glu Ile Val Asp Tyr Phe Lys
65 70 75 80

Gln Ser Phe Pro Glu Gly Tyr Ser Trp Glu Arg Ser Met Ser Tyr Glu 85 90 95

Asp Gly Gly Ile Cys Leu Ala Thr Asn Asn Ile Thr Met Lys Lys Asp 100 105 110

Gly Ser Asn Cys Phe Val Tyr Glu Ile Arg Phe Asp Gly Val Asn Phe
115 120 125

Pro Ala Asn Gly Pro Val Met Gln Arg Lys Thr Val Lys Trp Glu Pro
130 135 140

Ser Thr Glu Lys Met Tyr Val Arg Asp Gly Val Leu Lys Gly Asp Val 145 150 155 160 Asn Met Ala Leu Leu Gln Gly Gly Gly His Tyr Arg Cys Asp Phe 165 170 175 Arg Thr Thr Tyr Lys Ala Lys Lys Val Val Gln Leu Pro Asp Tyr His 180 185 190 Phe Val Asp His Arg Met Glu Ile Thr Ser His Asp Lys Asp Tyr Asn 195 200 205 Lys Val Lys Leu Tyr Glu His Ala Lys Ala His Ser Gly Leu Pro Arg 210 215 220 Leu Ala Lys 225` <210> 15 <211> 684 <212> DNA <213> favia favus <400> 15 atg agt gtg att aca tca gaa atg aag atg gag ctg cgt atg gaa ggc 48 Met Ser Val Ile Thr Ser Glu Met Lys Met Glu Leu Arg Met Glu Gly 1 5 10 15 gct gta aac ggg cac aag ttc gtg att aca ggg aaa gga agt ggc cag 96 Ala Val Asn Gly His Lys Phe Val Ile Thr Gly Lys Gly Ser Gly Gln 20 25 30 cct ttc gag gga ata cag aat gtg gac ctg aca gtc ata gag ggc gga 144 Pro Phe Glu Gly Ile Gln Asn Val Asp Leu Thr Val Ile Glu Gly Gly 35 40 45 cct ctt cct ttt gct ttc gat atc ctg aca aca gta ttc cat tac ggc 192

Pro	Leu	Pro	Phe	Ala	Phe	Asp	He	Leu	Thr	Thr	Val	Phe	His	Tyr	Gly	
	50					55					60					
aac	cgg	gta	ttt	gtc	aaa	tac	cca	gaa	gaa	ata	gta	gac	tac	ttc	aag	240
Asn	Arg	Val	Phe	Val	Lys	Tyr	Pro	Glu	Glu	Ile	Val	Asp	Tyr	Phe	Lys	
65					70					75					80	
cag	tcg	ttt	cct	gag	ggt	tat	tct	tgg	gaa	cga	agc	atg	agt	tac	gaa	288
Gln	Ser	Phe	Pro	Glu	Gly	Tyr	Ser	Trp	Glu	Arg	Ser	Met	Ser	Tyr	Glu	
				85					90					95		
gac	ggg	gga	att	tgc	ctc	gcc	aca	aac	aat	ata	acg	atg	aag	aaa	gac	336
Asp	Gly	Gly	Ile	Cys	Leu	Ala	Thr	Asn	Asn	Ile	Thr	Met	Lys	Lys	Asp	
			100					105					110			
ggc	agc	aac	tgt	ttt	gtc	tat	gaa	att	cga	ttt	gat	ggt	gtg	aac	ttt	384
Gly	Ser	Asn	Cys	Phe	Val	Tyr	Glu	Ile	Arg	Phe	Asp	Gly	Val	Asn	Phe	
		115					120					125				
cct	gcc	aat	ggt	cca	gtt	atg	cag	agg	aag	acc	gtc	aaa	tgg	gag	cca	432
Pro	Ala	Asn	Gly	Pro	Val	Met	Gln	Arg	Lys	Thr	Val	Lys	Trp	Glu	Pro	
	130					135					140					
tcc	act	gag	aaa	atg	tat	gtg	cgt	gat	gga	gtg	ctg	aag	ggt	gat	gtt	480
Ser	Thr	G1u	Lys	Met	Tyr	Val	Arg	Asp	Gly	Val	Leu	Lys	Gly	Asp	Val	
145					150					155					160	
aac	atg	gct	ctg	ttg	ctt	caa	gga	ggt	ggc	cat	tac	cga	tgt	gac	ttc	528
Asn	Met	Ala	Leu	Leu	Leu	Gln	Gly	Gly	Gly	His	Tyr	Arg	Cys	Asp	Phe	
				165					170					175		
aga	act	act	tac	aaa	gca	aag	aag	gtt	gtc	cag	ttg	cca	gac	tat	cac	576
Arg	Thr	Thr	Tyr	Lys	Ala	Lys	Lys	Val	Val	G1n	Leu	Pro	Asp	Tyr	His	
			180					185					190			
ttc	gtg	gat	cat	cga	atg	gag	ata	aca	agc	cat	gac	aag	gat	tac	aac	624

```
Phe Val Asp His Arg Met Glu Ile Thr Ser His Asp Lys Asp Tyr Asn
        195
                             200
                                                  205
aag gtt aag ctg tat gag cat gct aaa gct cat tcc ggg ctg cca agg 672
Lys Val Lys Leu Tyr Glu His Ala Lys Ala His Ser Gly Leu Pro Arg
    210
                         215
                                              220
ctg gcc aag taa
                                                                  684
Leu Ala Lys
225
<210> 16
<211> 227
<212> PRT
<213> favia favus
<400> 16
Met Ser Val Ile Thr Ser Glu Met Lys Ile Glu Val Arg Met Glu Gly
  1
                 5
                                      10
                                                           15
Ala Val Asn Gly His Lys Phe Val Ile Thr Gly Lys Gly Ser Gly Gln
             20
                                  25
                                                       30
Pro Phe Glu Gly Ile Gln Asn Val Asp Leu Thr Val Ile Glu Gly Gly
         35
                             40
                                                   45
Pro Leu Pro Phe Ala Phe Asp Ile Leu Thr Thr Ala Phe His Tyr Gly
     50
                         55
                                              60
Asn Arg Val Phe Val Lys Tyr Pro Glu Glu Ile Val Asp Tyr Phe Lys
65
                     70
                                          75
Gln Ser Phe Pro Glu Gly Tyr Ser Trp Glu Arg Ser Met Ser Tyr Glu
                 85
                                      90
                                                           95
Asp Gly Gly Ile Cys Leu Ala Thr Asn Asn Ile Thr Met Lys Lys Asp
            100
                                 105
                                                      110
```

Gly Ser Asn Cys Phe Val Asn Glu Ile Arg Phe Asp Gly Val Asn Phe Pro Ala Asn Gly Pro Val Met Gln Arg Lys Thr Val Lys Trp Glu Ser Ser Thr Glu Lys Met Tyr Val Arg Asp Gly Val Leu Lys Gly Asp Val Asn Met Ala Leu Leu Gln Gly Gly Gly His Tyr Arg Cys Asp Phe Arg Thr Thr-Tyr Lys Ala Lys Lys Val Val Gln Leu Pro Asp Tyr His Phe Val Asp His Leu Met Glu Ile Thr Ser His Asp Lys Asp Tyr Asn Lys Val Lys Leu Tyr Glu His Ala Lys Ala His Ser Gly Leu Pro Arg Leu Ala Lys <210> 17 <211> 684 <212> DNA <213> favia favus <400> 17 atg agt gtg att aca tca gaa atg aag atc gag gtg cgt atg gaa ggc 48 Met Ser Val Ile Thr Ser Glu Met Lys Ile Glu Val Arg Met Glu Gly gct gta aac ggg cac aag ttc gtg att aca ggg aaa gga agt ggc cag 96 Ala Val Asn Gly His Lys Phe Val Ile Thr Gly Lys Gly Ser Gly Gln

CCt	LLC	gag	gga	ala	cag	aaı	grg	gac	cig	aca	gic	ata	gag	ggc	gga	144
Pro	Phe	Glu	Gly	Ile	Gln	Asn	Val	Asp	Leu	Thr	Val	Ile	Glu	Gly	Gly	
		35					40					45				
cct	ctt	cct	ttt	gct	ttc	gat	atc	ctg	aca	aca	gca	ttc	cat	tac	ggc	192
Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile	Leu	Thr	Thr	Ala	Phe	His	Tyr	Gly	
	50					55					60					
aac	cgg	gta	ttt	gtc	aaa	tac	cca	gaa	gaa	ata	gta	gac	tac	ttc	aag	240
Asn	Arg	Val	Phe	Val	Lys	Tyr	Pro	Glu	Glu	Ile	Val	Asp	Tyr	Phe	Lys	
65		-	. .		70					75					80	
cag	tcg	ttt	cct	gag	ggt	tat	tct	tgg	gaa	cga	agc	atg	agt	tac	gaa	288
G1n	Ser	Phe	Pro	G1u	Gly	Tyr	Ser	Trp	Glu	Arg	Ser	Met	Ser	Tyr	Glu	
				85					90					95		
gac	ggg	gga	att	tgc	ctc	gcc	aca	aac	aat	ata	acg	atg	aag	aaa	gac	336
Asp	Gly	Gly	Ile	Cys	Leu	Ala	Thr	Asn	Asn	Ile	Thr	Met	Lys	Lys	Asp	
			100					105					110			
ggc	agc	aac	tgt	ttt	gtc	aat	gaa	att	cga	ttt	gat	ggt	gtg	aac	ttt	384
G1y	Ser	Asn	Cys	Phe	Val	Asn	Glu	Ile	Arg	Phe	Asp	Gly	Val	Asn	Phe	
		115					120					125				
cct	gcc	aat	ggt	cca	gtt	atg	cag	agg	aag	acc	gtc	aaa	tgg	gag	tca	432
Pro	Ala	Asn	Gly	Pro	Val	Met	Gln	Arg	Lys	Thr	Val	Lys	Trp	Glu	Ser	
	130					135					140					
tcc	act	gag	aaa	atg	tat	gtg	cgt	gat	gga	gtg	ctg	aag	ggt	gat	gtt	480
Ser	Thr	Glu	Lys	Met	Tyr	Val	Arg	Asp	Gly	Val	Leu	Lys	Gly	Asp	Val	
145					150					155					160	
aac	atg	gct	ctg	ttg	ctt	caa	gga	ggt	ggc	cat	tac	cga	tgt	gac	ttc	528
Asn	Met	Ala	Leu	Leu	Leu	Gln	Gly	G1y	Gly	His	Tyr	Arg	Cys	Asp	Phe	
				165					170					175		

aga	acı	acı	lac	aaa	gca	aag	aag	gtt	gtc	cag	ttg	cca	gac	tat	cac	576
Arg	Thr	Thr	Tyr	Lys	Ala	Lys	Lys	Val	Val	Gln	Leu	Pro	Asp	Tyr	His	
			180					185					190			
ttc	gtg	gat	cat	cta	atg	gag	ata	aca	agc	cat	gac	aag	gat	tac	aac	624
Phe	Val	Asp	His	Leu	Met	Glu	Ile	Thr	Ser	His	Asp	Lys	Asp	Tyr	Asn	
		195					200					205				
aag	gtt	aag	ctg	tat	gag	cat	gct	aaa	gct	cat	tcc	ggg	ctg	cca	agg	672
Lys	Val	Lys	Leu	Tyr	Glu	His	Ala	Lys	Ala	His	Ser	Gly	Leu	Pro	Arg	
	210	-	. .			215					220					
ctg	gcc	aag	taa													684
Leu	Ala	Lys														
225																
<210)> 18	3														
<21	1> 22	27														
<212	2> PI	RT														
<213	3> fa	avia	favı	ıs												
<400)> 18	3														
Met	Ser	Val	Ile	Thr	Ser	Glu	Met	Lys	Ile	Glu	Leu	Arg	Met	Glu	Gly	
1				5					10					15		
Ala	Val	Asn	Gly	His	Lys	Phe	Val	Ile	Thr	Gly	Lys	G1y	Ser	Gly	Gln	
			20					25					30			
Pro	Phe	Glu	Gly	Ile	G1n	Asn	Val	Asp	Leu	Thr	Val	Ile	Glu	Gly	Gly	
		35					40					45				
Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile	Leu	Thr	Thr	Ala	Phe	His	Tyr	Gly	
	50					55					60					
Asn	Arg	Val	Phe	Val	G1u	Tyr	Pro	Glu	Glu	Ile	Val	Asp	Tyr	Phe	Lys	
65					70					75					80	

Gln Ser Phe Pro Glu Gly Tyr Ser Trp Glu Arg Ser Met Ser Tyr Glu Asp Gly Gly Ile Cys Leu Ala Thr Asn Asn Ile Thr Met Lys Lys Asp Gly Ser Asn Cys Phe Val Asn Glu Ile Arg Phe Asp Gly Val Asn Phe Pro Ala Asn Gly Pro Val Met Gln Arg Lys Thr Val Lys Trp Glu Pro Ser Thr Glu-Lys Met Tyr Val Arg Asp Gly Val Leu Lys Gly Asp Val Asn Met Ala Leu Leu Gln Gly Gly Gly His Tyr Arg Cys Asp Phe Arg Thr Thr Tyr Lys Ala Lys Lys Val Val Gln Leu Pro Asp Tyr His Phe Val Asp His Gln Met Glu Ile Thr Ser His Asp Lys Asp Tyr Asn Lys Val Lys Leu Tyr Glu His Ala Lys Ala His Ser Gly Leu Pro Arg Leu Ala Lys <210> 19 <211> 684 <212> DNA <213> favia favus

17/22

atg agt gtg att aca tca gaa atg aag atc gag ctg cgt atg gaa ggc 48

Met Ser Val Ile Thr Ser Glu Met Lys Ile Glu Leu Arg Met Glu Gly

<400> 19

1				5					10					15		
gct	gta	aac	ggg	cac	aag	ttc	gtg	att	aca	ggg	aaa	gga	agt	ggc	cag	96
Ala	Val	Asn	Gly	His	Lys	Phe	Val	Ile	Thr	Gly	Lys	Gly	Ser	G1y	Gln	
			20					25					30			
cct	ttc	gag	gga	ata	cag	aat	gtg	gac	ctg	aca	gtc	ata	gag	ggc	gga	144
Pro	Phe	Glu	Gly	Ile	Gln	Asn	Val	Asp	Leu	Thr	Val	Ile	Glu	Gly	Gly	
		35					40					45				
cct	ctt	cct	ttt	gct	ttc	gat	atc	ctg	aca	aca	gca	ttc	cat	tac	ggc	192
Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile	Leu	Thr	Thr	Ala	Phe	His	Tyr	G1y	
	50					55					60					
aac	cgg	gta	ttt	gtc	gaa	tac	cca	gaa	gaa	ata	gta	gac	tac	ttc	aag	240
Asn	Arg	Val	Phe	Val	Glu	Tyr	Pro	Glu	Glu	Ile	Val	Asp	Tyr	Phe	Lys	
65					70					75					80	
cag	tcg	ttt	cct	gag	ggt	tat	tct	tgg	gaa	cga	agc	atg	agt	tac	gaa	288
Gln	Ser	Phe	Pro	Glu	Gly	Tyr	Ser	Trp	Glu	Arg	Ser	Met	Ser	Tyr	Glu	
				85					90					95		
gac	ggg	gga	att	tgc	ctc	gcc	aca	aac	aat	ata	acg	atg	aag	aaa	gac	336
Asp	Gly	Gly	Ile	Cys	Leu	Ala	Thr	Asn	Asn	Ile	Thr	Met	Lys	Lys	Asp	
			100					105					110			
ggc	agc	aac	tgt	ttt	gtc	aat	gaa	att	cga	ttt	gat	ggt	gtg	aac	ttt	384
Gly	Ser	Asn	Cys	Phe	Val	Asn	Glu	Ile	Arg	Phe	Asp	Gly	Val	Asn	Phe	
		115					120					125				
cct	gcc	aat	ggt	cca	gtt	atg	cag	agg	aag	acc	gtc	aaa	tgg	gag	cca	432
Pro	Ala	Asn	Gly	Pro	Val	Met	Gln	Arg	Lys	Thr	Val	Lys	Trp	Glu	Pro	
	130					135					140					
tcc	act	gag	aaa	atg	tat	gtg	cet	gat	០០១	σtσ	cta	22 r	aat	ret	ata	180

Ser Thr Glu Lys Met Tyr Val Arg Asp Gly Val Leu Lys Gly Asp Val

"

```
145
                    150
                                         155
                                                              160
aac atg gct ctg ttg ctt caa gga ggt ggc cat tac cga tgt gac ttc 528
Asn Met Ala Leu Leu Gln Gly Gly Gly His Tyr Arg Cys Asp Phe
                165
                                     170
                                                          175
aga act act tac aaa gca aag aag gtt gtc cag ttg cca gac tat cac 576
Arg Thr Thr Tyr Lys Ala Lys Lys Val Val Gln Leu Pro Asp Tyr His
            180
                                 185
                                                     190
ttc gtg gat cat caa atg gag ata aca agc cat gac aag gat tac aac 624
Phe Val Asp His Gln Met Glu Ile Thr Ser His Asp Lys Asp Tyr Asn
        195
                            200
                                                 205
aag gtt aag ctg tat gag cat gct aaa gct cat tcc ggg ctg cca agg 672
Lys Val Lys Leu Tyr Glu His Ala Lys Ala His Ser Gly Leu Pro Arg
    210
                        215
                                             220
ctg gcc aag taa
                                                                  684
Leu Ala Lys
225
<210> 20
<211> 227
<212> PRT
<213> favia favus
<400> 20
Met Ser Val Ile Thr Ser Glu Met Lys Met Glu Leu Arg Met Glu Gly
  1
                 5
                                      10
                                                          15
Ala Val Asn Gly His Lys Phe Val Ile Thr Gly Lys Gly Ser Gly Gln
             20
                                 25
                                                      30
Pro Phe Glu Gly Ile Gln Asn Met Asp Leu Thr Val Ile Glu Gly Gly
         35
                             40
                                                  45
```

Pro	Leu	Pro	Phe	Ala	Phe	Asp	ile	Leu	Thr	Thr	Ala	Phe	Gly	His	Gly
	50					55					60				
Asn	Arg	Val	Phe	Val	Lys	Tyr	Pro	Glu	G1u	Ile	Val	Asp	Tyr	Phe	Lys
65					70					75					80
Gln	Ser	Phe	Pro	Glu	Gly	Tyr	Ser	Trp	Glu	Arg	Ser	Met	Xaa	Tyr	Glu
				85					90					95	
Asp	Gly	Gly	Ile	Cys	Leu	Ala	Thr	Asn	Asn	Ile	Thr	Met	Lys	Lys	Asp
			100					105					110		
Gly	Ser	Asn	Cys	Phe	Val	Tyr	Glu	Ile	Arg	Phe	Asp	Gly	Val	Asn	Phe
		115					120					125			
Pro	Ala	Asn	Gly	Pro	Val	Met	Gln	Arg	Lys	Thr	Val	Lys	Trp	Glu	Pro
	130					135					140				
Ser	Thr	Glu	Lys	Met	Tyr	Val	Arg	Asp	Gly	Val	Leu	Lys	Gly	Asp	Val
145					150					155					160
Asn	Met	Ala	Leu	Leu	Leu	Gln	Gly	Gly	Gly	His	Tyr	Arg	Cys	Asp	Phe
				165					170					175	
Arg	Thr	Thr	Tyr	Lys	Ala	Lys	Lys	Val	Val	Gln	Leu	Pro	Asp	Tyr	His
			180					185					190		
Phe	Val	Asp	Leu	Arg	Thr	Glu	Ile	Thr	Ser	His	Asp	Lys	Asp	Tyr	Asn
		195					200					205			
Lys	Val	Lys	Leu	Tyr	Glu	His	Ala	Lys	Ala	His	Ser	Gly	Leu	Pro	Arg
	210					215					220				
Leu	Ala	Lys													
225															
<210)> 21	L													
<211	.> 68	34													
<212	2> DN	JA													

(21,	3> f	avia	fav	us												
<400	0> 2	1														
atg	agt	gtg	att	aca	tca	gaa	atg	aag	atg	gag	ctg	cgt	atg	gaa	ggc	48
Met	Ser	Val	Ile	Thr	Ser	Glu	Met	Lys	Met	Glu	Leu	Arg	Met	Glu	Gly	
1				5					10					15		
gct	gta	aac	ggg	cac	aag	ttc	gtg	att	aca	ggg	aaa	gga	agt	ggc	cag	96
Ala	Val	Asn	Gly	His	Lys	Phe	Val	Ile	Thr	Gly	Lys	Gly	Ser	Gly	Gln	
			20					25					30			
cct	ttc	gag	-gga	ata	cag	aat	atg	gac	ctg	aca	gtc	ata	gag	ggc	gga	144
Pro	Phe	Glu	Gly	Ile	Gln	Asn	Met	Asp	Leu	Thr	Val	Ile	Glu	Gly	Gly	
		35					40					45				
cct	ctt	cct	ttt	gct	ttc	gat	atc	ctg	aca	aca	gca	ttc	ggt	cac	ggc	192
Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile	Leu	Thr	Thr	Ala	Phe	Gly	His	Gly	
	50					55					60					
aac		gta	ttt	gtc	aaa		cca	gaa	gaa	ata		gac	tac	ttc	aag	240
	cgg					tac					gta			ttc Phe		240
	cgg					tac					gta					240
Asn 65	cgg Arg	Val	Phe	Val	Lys 70	tac Tyr	Pro	Glu	Glu	Ile 75	gta Val	Asp	Tyr		Lys 80	
Asn 65 cag	cgg Arg	Val ttt	Phe cct	Val gag	Lys 70 ggt	tac Tyr tat	Pro tct	Glu tgg	Glu	Ile 75 cga	gta Val agc	Asp	Tyr	Phe	Lys 80 gaa	
Asn 65 cag	cgg Arg	Val ttt	Phe cct	Val gag	Lys 70 ggt	tac Tyr tat	Pro tct	Glu tgg	Glu	Ile 75 cga	gta Val agc	Asp	Tyr	Phe	Lys 80 gaa	
Asn 65 cag Gln	cgg Arg tcg Ser	Val ttt Phe	Phe cct Pro	Val gag Glu 85	Lys 70 ggt Gly	tac Tyr tat Tyr	Pro tct Ser	Glu tgg Trp	Glu gaa Glu 90	Ile 75 cga Arg	gta Val agc Ser	Asp atg Met	Tyr agt Xaa	Phe tac Tyr	Lys 80 gaa Glu	288
Asn 65 cag Gln gac	cgg Arg tcg Ser	Val ttt Phe	Phe cct Pro	Val gag Glu 85 tgc	Lys 70 ggt Gly ctc	tac Tyr tat Tyr	Pro tct Ser	Glu tgg Trp aac	Glu gaa Glu 90 aat	Ile 75 cga Arg	gta Val agc Ser	Asp atg Met	Tyr agt Xaa aag	Phe tac Tyr 95	Lys 80 gaa Glu gac	288
Asn 65 cag Gln gac	cgg Arg tcg Ser	Val ttt Phe	Phe cct Pro	Val gag Glu 85 tgc	Lys 70 ggt Gly ctc	tac Tyr tat Tyr	Pro tct Ser	Glu tgg Trp aac	Glu gaa Glu 90 aat	Ile 75 cga Arg	gta Val agc Ser	Asp atg Met	Tyr agt Xaa aag	Phe tac Tyr 95 aaa	Lys 80 gaa Glu gac	288
Asn 65 cag Gln gac Asp	cgg Arg tcg Ser ggg Gly	Val ttt Phe gga Gly	Phe cct Pro att Ile 100	yal gag Glu 85 tgc Cys	Lys 70 ggt Gly ctc Leu	tac Tyr tat Tyr gcc Ala	Pro tct Ser aca Thr	Glu tgg Trp aac Asn 105	Glu gaa Glu 90 aat Asn	Ile 75 cga Arg ata Ile	gta Val agc Ser acg Thr	Asp atg Met atg Met	Tyr agt Xaa aag Lys 110	Phe tac Tyr 95 aaa	Lys 80 gaa Glu gac Asp	288 336
Asn 65 cag Gln gac Asp	cgg Arg tcg Ser ggg Gly	Val ttt Phe gga Gly	Phe cct Pro att Ile 100 tgt	Val gag Glu 85 tgc Cys	Lys 70 ggt Gly ctc Leu gtc	tac Tyr tat Tyr gcc Ala	Pro tct Ser aca Thr	Glu tgg Trp aac Asn 105 att	Glu gaa Glu 90 aat Asn	Ile 75 cga Arg ata Ile	gta Val agc Ser acg Thr	Asp atg Met atg Met	Tyr agt Xaa aag Lys 110 gtg	Phe tac Tyr 95 aaa Lys	Lys 80 gaa Glu gac Asp	288 336

 $\mathtt{cct}\ \mathtt{gcc}\ \mathtt{aat}\ \mathtt{ggt}\ \mathtt{cca}\ \mathtt{gtt}\ \mathtt{atg}\ \mathtt{cag}\ \mathtt{agg}\ \mathtt{aag}\ \mathtt{acc}\ \mathtt{gtc}\ \mathtt{aaa}\ \mathtt{tgg}\ \mathtt{gag}\ \mathtt{cca}\ \mathtt{432}$

Pro	Ala	Asn	Gly	Pro	Val	Met	Gln	Arg	Lys	Thr	Val	Lys	Trp	Glu	Pro	
	130					135					140					
tcc	act	gag	aaa	atg	tat	gtg	cgt	gat	gga	gtg	ctg	aag	ggt	gat	gtt	480
Ser	Thr	Glu	Lys	Met	Tyr	Val	Arg	Asp	Gly	Val	Leu	Lys	Gly	Asp	Val	
145					150					155					160	
aac	atg	gct	ctg	ttg	ctt	caa	gga	ggt	ggc	cat	tac	cga	tgt	gac	ttc	528
Asn	Met	Ala	Leu	Leu	Leu	Gln	Gly	Gly	Gly	His	Tyr	Arg	Cys	Asp	Phe	
				165					170					175		
aga	act	act-	-tac	aaa	gca	aag	aag	gtt	gtc	cag	ttg	cca	gac	tat	cac	576
Arg	Thr	Thr	Tyr	Lys	Ala	Lys	Lys	Val	Val	Gln	Leu	Pro	Asp	Tyr	His	
			180					185					190			
ttc	gtg	gat	ctt	cga	act	gag	ata	aca	agc	cat	gac	aag	gat	tac	aac	624
Phe	Val	Asp	Leu	Arg	Thr	Glu	Ile	Thr	Ser	His	Asp	Lys	Asp	Tyr	Asn	
		195					200					205				
aag	gtt	aag	ctg	tat	gag	cat	gct	aaa	gct	cat	tcc	ggg	ctg	cca	agg	672
Lys	Val	Lys	Leu	Tyr	Glu	His	Ala	Lys	Ala	His	Ser	Gly	Leu	Pro	Arg	
	210					215					220					
ctg	gcc	aag	taa													684
Leu	Ala	Lys														